BIO FAX!

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Lung Model

Student Laboratory Kit

Introduction

We breathe twenty-four hours a day, every day, without consciously thinking about it. What causes air to rush into our lungs and then rush out again?

Concepts

- Differential air pressure
- Inhalation
- Exhalation

Materials

Balloon, large
Balloon, small
Plastic cup with hole, transparent
Rubber stopper, 1-hole
Scissors

Safety Precaution

Wear protective goggles when working with balloons as they may snap off when stretched. Follow all laboratory safety guidelines.

Procedure

1. Place the small balloon over the large end of the one-hole stopper as shown in Figure 1.
2. Insert the rubber stopper securely into the hole from the inside of the plastic cup.
3. Use sharp scissors to cut the large balloon as shown in Figure 2.
4. Have a lab partner hold the cup containing the small balloon. Stretch the large balloon over the end of the cup. Your final model should look like Figure 1.
5. Carefully move the center of the large balloon up and down. Do not pull or push too hard.
6. Answer the questions on the Lung Model Worksheet.

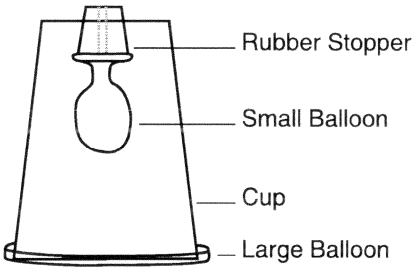

Figure 1. Completed Model

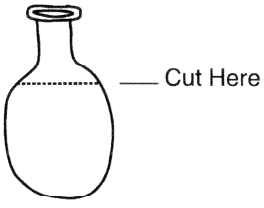

Figure 2. Cutting Large Balloon

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Lung Model Worksheet

Circle the correct answers or fill in the blanks.

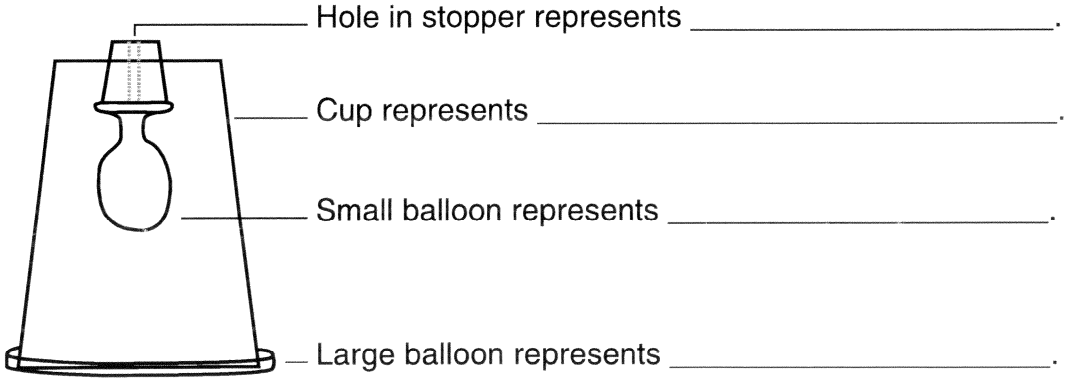
1. When the large balloon is pulled down, it makes the total volume inside the cup chamber (larger, smaller). When this happens the small balloon (inflates, deflates).

2. When the large balloon is pushed up, it makes the total volume inside the cup chamber (larger, smaller). When this happens the small balloon (inflates, deflates).

3. When the cavity inside the cup chamber gets smaller, the air pressure inside the chamber (increases, decreases). This pressure difference between the inside and outside of the chamber causes air to (move into, move out of) the small balloon.

4. When the cavity inside the cup chamber gets larger, the air pressure inside the chamber (increases, decreases). This pressure difference causes air to (move into, move out of) the small balloon.

5. Fill in the blanks.



6. When the diaphragm contracts, the chest cavity gets (larger, smaller), the air pressure inside the lungs (increases, decreases), air (enters, leaves) the lungs and they (inflate, deflate).

7. When the diaphragm relaxes, the chest cavity gets (larger, smaller), the air pressure inside the lungs (increases, decreases), air (enters, leaves) the lungs and they (inflate, deflate).

8. In the model the chest cavity cannot expand. In our body the chest cavity expands and contracts. How is this expansion and contraction coordinated with diaphragm movements?